- System Expansion
  - Adding or subtracting a DSM or QT board from an existing crate
    - Edit appropriate Crate Configuration File (CCF)
      - Update the DSM_Number or QT_Number declaration in the CCF to reflect the new board population
      - Add (or subtract) a section to the CCF that includes:
        - A comment line with a name for the new board (e.g. ##PP101)
        - The VME address of the new board (e.g. DSM_BASE_ADDRESS 0x10000000 QT_BASE_ADDRESS 0x10000000
        - Any configuration parameters (best is to cut and paste the configuration section for a similar board (e.g. DSM, QT32B, or QT32C) and edit to supply the correct values for this new board
  - Edit Layer 0 code (e.g. include files)
    - If a DSM is added/subtracted then the FPGALoad.C file in ~trg/trg_soft_dev/trglib must be updated with the correct number and vme address of the new board and the level 0 code recompiled
    - Addition of a DSM also requires modification of one or more of the stuctures defined in ~trg/trg_soft_dev/include/trgDataDefs.h
      - A copy of the new trgDataDefs.h labeled with a version number (trgDataDefs_##.h) should also be placed in this directory
    - If a QT is added/subtracted then the QT_Reg_Load.C file in ~trg/trg_soft_dev/trglib must be updated with the correct number and vme address of the new board and the level 0 code recompiled
    - Any changes to the level 0 software should be checked in to the CVS library
    - Any recompilations of the level 0 code should be reported to the L2 manager (chris perkins), the DAQ/run_control manager (jeff landgraff) and the trigger offline software manager (akio ogawa).

  - Adding an additional DSM or QT crate
    - Physically add new crate
      - Coordinate rack position with STSG group
      - Install crate and outfit with MVME2306 cpu with STP-Mezz card, RCC2/RCF2 boards, DSMs/QTs
      - Cable MVME2306 to trg.bnl.local subnet, cable MVME2306 debug port to a trigger terminal server, install fiber from STP-

Mezz to STP-concentrator port, connect RCC2 to master RCC2 in L0/L1 crate (or surrogate RCC2).
- Update RCF2 cabling table in RCC2 users manual on trigger web.
- Request an IP number on the trg.bnl.local subnet from tonko
- Add new node/IP to trg rhosts file on startrg.starp.bnl.gov
- Configure MVME2306 to boot either dsm.startup.min or qt.startup.min
- a Crate subdirectory (~trg/cfg/<new-node-name>) and Crate Configuration File will need to be created for the new crate.
- Create new TRG_NODE names in rtssystems.h
- Follow "Adding or subtracting a DSM or QT board from an existing crate" instructions above to add new DSM/QT boards
- Coordinate with Eleanor the FPGA codes (e.g. DSM .rbt files or QT .mcs files) to be loaded.
- Create the code that generates LUT files to deal with the new QT crates.
- MakeConfig and ReadConfig will need to be recompiled, the new crate will need to be added to the dictionary line in the Tier1 Control File.
  - The source code for MakeConfig and ReadConfig are kept on startrg.starp.bnl.gov:~trg/trg_soft_dev/util/SUN/Tier
  - The executables are kept in ~trg/bin
- Have jeff modify Run Control to include the new crate.
- Have chris modify L2 to include the data from these new crates, and calculate their pedestals.
- Have chris update the bit checker for the new hardware/software configuration.
- Re-boot the MVME2306 CPU and check that it connects correctly to Run Control.
- Configure the system using the new pedestal Tier1 file and check that all the modules in the new crates (RCC2 and QT) are configured correctly.
- Check that each DSM/QT board is receiving the clock correctly
- Check that the monitoring RCC2 is receiving its clock correctly via the upstream RCC2. The address counters on the 2 RCC2 boards should remain synchronized when they are both put in RUN mode.
- Take a pedestal run using the new pedestal Tier1 file and check that the system configures and runs without crashing, that the data is OK and the pedestal files are generated correctly.
- Configure a physics run and check that the pedestal files are downloaded correctly to the right memory location.
- Identify someone to work on the online monitoring histograms
- Notify Akio of the presence of the new crate so he can update their unpacking and RCC2 monitoring code.

- Same notification to Zilong/Srikanta so they can update the L0trg code.
  - And lots more :o).